



**Michigan Department of Consumer & Industry Services  
Bureau of Construction Codes & Fire Safety  
P.O. Box 30254  
Lansing, Michigan 48909  
(517) 241-9302**

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Technical Bulletin**

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**Testing of Safety and  
Safety Relief Valves**

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Technical bulletins are issued to provide clarification on issues that arise regarding code administration and enforcement. The information provided in the bulletin is developed to promote uniform interpretation and enforcement of the state codes by the Bureau of Construction Codes & Fire Safety.

## **TESTING OF SAFETY AND SAFETY RELIEF VALVES**

### **Issue**

Testing frequency of safety and safety relief valves.

### **Code Requirement**

In 1995 the boiler rules adopted ASME code CSD-1, Controls and Safety Devices for Automatically Fired Boilers under R 408.4027 of the administrative rules. This rule indicates that the testing frequency for these valves shall be monthly for low pressure and annually for high-pressure boilers.

### **Discussion**

Within the boiler industry, safety and safety relief valves are considered one of the most important safety components of a boiler. These valves are literally the last line of defense against catastrophic failure of the pressure parts of a boiler should other controls and safety devices fail. The frequencies for testing required by R 408.4027 of the Michigan Boiler Law and Rules are not arbitrary figures without support of the standards writing industry.

The basis for the testing frequency comes from several nationally recognized standards. Review of CSD-1 table D-1 located in the non-mandatory appendix D reveals that testing of these valves are to be in accordance with ASME code sections VI, Recommended Rules for the Care and Operation of Heating Boilers and section VII, Recommended Guidelines for Care of Power Boilers. ASME code section VI exhibit C subsection IV for steam boilers states that the safety valve should be tested by lifting the try lever every 30 days of operation and after any period of inactivity. ASME code section VI exhibit C subsection V for water boilers makes the same statement. ASME code section VII subsection C4 addresses the testing frequency for safety valves on power boilers stating that the normal testing cycle is one year.

Another standard that addresses the testing frequency of safety and safety relief valves is the National Board of Boiler and Pressure Vessel Inspectors Inspection Code (NBIC). This standard recommends manual testing every 2 months for hot water boilers and power boilers operating at less than 400 psi.

Inspection experience indicates failure of a safety or safety relief valve to re-seat after a manual test is usually caused by contaminants in the water or steam in the boiler. These contaminants prevent the valve from operating properly and are most often caused by inadequate boiler maintenance. e.g. regular blowdown, proper water treatment etc. Infrequent testing of the valve can cause contaminants to build up at the valve seat also preventing it from functioning properly. The lack of proper testing of valves is the most common cause of inoperable valves.

This document is not intended to describe in detail the testing requirements of safety and safety relief valves. It is only intended to address the basis for testing frequencies.

## **Conclusion**

The owner or user of a boiler is required to ensure that the boiler is properly maintained and safely operated. The boiler law places the responsibility directly on the owner or user to ensure that the testing of controls and safety devices are conducted in accordance with the requirements of R 408.4027 of the administrative rules.

It must be noted that safety and safety relief valve testing beyond the manual try lever test may be complicated and should not be attempted by anyone not fully trained in the procedure. Even the manual try lever test involves more than just lifting the lever. Procedures are clearly defined in ASME code sections VI and VII. A copy of the code should be obtained before attempting to accomplish the required test.

Following is a reprint of R 408.4027 of the administrative rules detailing the required frequency of testing.

R 408.4027 Adoption; ASME code CSD-1.

Rule 27 (1) The owner shall ensure that the assembly, maintenance, operation, and testing of controls and safety devices is in accordance with ASME code CSD-1, 1998 edition, and its addenda, except as modified by these rules. The code and addenda are adopted by reference in these rules and may be reviewed at the Okemos office of the Department of Consumer and Industry Services, Bureau of Construction Codes & Fire Safety, Boiler Division, 2501 Woodlake Circle, Okemos, Michigan 48864. The code may be purchased at a cost as of the time of adoption of these rules of \$52.00 from the American Society of Mechanical Engineers, 22 Law Drive, Fairfield, New Jersey 07007, or from the Michigan Department of Consumer and Industry Services, Bureau of Construction Codes & Fire Safety, 2501 Woodlake Circle, Okemos, Michigan 48864.

(2) An owner or user of an automatic boiler system shall ensure that the testing of controls and safety devices is conducted in accordance with the following minimum requirements:

<u>Item</u>	<u>Frequency</u>	<u>Personnel</u>	<u>Remarks</u>
Burner/combustion controls	Annual	Service technician	Manufacturer's instruction
Low water fuel cutoff	Monthly	User/operator	Slow drain test until boiler shuts down (SEE NOTE 1)

High/operating safety limits	Annual	Service technician	Manufacturer's instruction
Safety valves	Monthly low pressure Annual high pressure	User/operator	Manually with 75% of set pressure on boiler, or tested by manufacturer's representative

*Note 1: An alternate test may be conducted on hot water heating boilers if acceptable to the inspector.*

(3) An owner or user of an automatic boiler system shall ensure that testing is conducted in accordance with the manufacturer's instruction. Personnel who conduct the testing are not required to be licensed under the act. The owner or user shall provide the inspector, at the time of certificate inspection, with evidence showing what tests have been completed. The inspector may require additional testing if deemed necessary.

Questions regarding this technical bulletin may be directed to the Michigan Department of Consumer and Industry Services, Bureau of Construction Codes & Fire Safety, Boiler Division, P.O. Box 30254, Lansing, MI 48909 or by calling (517) 241-9334.